Space Weather Forecast

Issued on Monday, 22 April 2024 at 01:20 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: Moderate class flares expected (R1/R2 blackouts). Slight chance of isolated G1/Minor Storm intervals from peripheral coronal mass ejection effects.

Solar Activity: Moderate with three Moderate flares observed, the two most intense but also briefest ones were from a small region in the southwest of the complex of sunspots in the southwest disc. The other was less intense, but lasted slightly longer, and was from the larger northwesternmost sunspot in the same complex. This complex contains four sunspot of the seventeen sunspot regions currently on the disc. Other notable regions including a moderately sized sunspot in the northwest, however this remains stable with a simple bipolar configuration. The most rapid growth was observed in two regions in the northeast, although these also remain simple and stable bipolar regions. Spot growth also occurred on the southeast disc, however these spots remain small and simple.

The Moderate flares resulted in further weak and southward directed coronal mass ejections (CMEs), which are still under analysis for any Earth-directed impacts.

Solar Wind / Geomagnetic Activity: Ongoing fast wind influence from a coronal hole was likely through the period with solar wind speeds slightly elevated throughout, 420-480 km/s. Interplanetary Magnetic Field (IMF) was weak with the north-south component weakly negative (southward) for much of the period with minimum -6nT. Only brief weakly northward periods were observed. Geomagnetic activity was Unsettled to Active (Kp3-4).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Occasional Moderate flares are expected, with a slight chance of isolated Strong flares.

Solar Wind / Geomagnetic Activity: There are multiple Coronal Mass Ejections that are expected to pass close to Earth through the period, but with the potential of giving glancing interactions. This gives low confidence to the detail for the geomagnetic forecast. Otherwise ongoing fast winds from a coronal hole are expected to gradually ease, with solar wind speeds gradually easing from Slightly Elevated to Background. Quiet to Active geomagnetic activity at first is forecast to ease to be mainly Quiet with isolated Unsettled intervals by day 2 (23 Apr). Any CME arrivals however, will give a chance of further isolated Active intervals and a slight chance of briefly reaching G1 Minor Storm.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to persist at background, but with a chance of rising with any larger flares that occur. This will bring a slight chance of reaching the S1 Solar Radiation Storm level.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.

Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	5	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	80	75	75	70
Very Active	R3 to R5 X	No	15	15	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	15	15	15
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.